

**REMARKS****Claim Amendment**

Applicants note that M.P.E.P. sect. 608.01(p) states:

An application as filed must be complete in itself in order to comply with 35 U.S.C. 112. Material nevertheless may be incorporated by reference, *Ex parte Schwarze*, 151 USPQ 426 (Bd. Ape. 1966). An application for a patent when filed may incorporate "essential material" by reference to (1) a U.S. patent, (2) a U.S. patent application publication, or (3) a pending U.S. application, subject to the conditions set forth below.

The instant application incorporates by reference the co-pending U.S. Pat. App. No. 10/780,901, now scheduled to published as Pub. No. 2005/0074611.

**Amendment of Claims 1, 14 and 17**

Claims 1, 14 and 17 have been amended to correct an erroneous recitation that the refractive index of a refractive material is greater than about 1.8.

Applicants note that aluminum oxide  $\text{Al}_2\text{O}_3$  is included in a list of refractive materials on page 12, line 15, page 14, lines 4-6 in conjunction with FIG. 12 and the original Claim 7. Refractive index of aluminum oxide is 1.63 - 1.68. See Exhibit A, enclosed herewith. (Exhibit A is page E-365 of the Handbook on Chemistry and Physics, 66<sup>th</sup> Ed. The appropriate entry is highlighted for the Examiner's convenience.)

Original Claim 1 of the instant application recites that the refractive index a refracting material is greater than about 1.8. However, original Claim 7, dependent on Claim 1, recites  $\text{Al}_2\text{O}_3$ , a material having refractive index smaller than 1.8, among the materials from which the nanoparticles of the instant invention can be produced. This renders original Claims 1 and 7 contradictory. Examination of the instant specification, specifically of page 12, line 14, page 14, lines 4 - 6 and FIG. 12, which describes particles coated by aluminum oxide, indicates that it is the recitation in Claim 1 that the refractive index is greater than about 1.8 that is clearly erroneous.

Subject matter of original Claim 7 is now incorporated into new Claim 31, submitted by the present amendment to the instant application. Accordingly, Applicants amended Claims 1, 14 and 17 to correct the erroneous recitation of the refractive index.

Further Amendments

Claim 1 has been amended to more particularly point out and define one of the embodiments of the present invention. Support for this amendment is found in the co-pending U.S. Pat. App. No. 10/780,901, page 14, lines 22 - 25, and in the instant application, original Claim 7 and on page 12, line 15.

Claim 4 has been amended to incorporate the subject matter of Claims 5 and 6, now cancelled, to more particularly point out that the diameter of the particles can vary from about 0.1 nm to about 300 nm. Support for this amendment is found in Claims 4 through 6 of the co-pending U.S. App. No. 10/780,901.

Claim 7 has been amended to more particularly point out and define one embodiment of the present invention claimed in the original Claim 1.

Claim 8 has been amended to reflect the new dependency and to incorporate the subject matter of Claims 9 - 10, now cancelled. Claim 8 as amended further defines the embodiment claimed in Claim 7 and more particularly points out that the peak of absorption of the particles of the present invention can be adjusted from about 200 nm to about 750 nm. Support for this amendment is found on page 16, line 27 through page 17, line 1 of the co-pending U.S. App. No. 10/780,901.

Claim 11 has been amended to reflect the new dependency and to incorporate the subject matter of Claims 12 - 13, now cancelled. Claim 11 as amended further defines the embodiment claimed in new Claim 31 and more particularly points out that the peak of absorption of the particles of the present invention can be adjusted from about 200 nm to about 750 nm. Support for this amendment is found on page 16, line 27 through page 17, line 1 of the co-pending U.S. App. No. 10/780,901.

Claim 14 has been amended to more particularly point out and define one of the embodiments of the present invention. Support for this amendment is found in the co-pending U.S. Pat. App. No. 10/780,901, page 14, lines 22 - 25, and in the original Claim 7 and on page 12, line 15 of the instant application.

Claim 15 has been amended to more particularly point out one of the embodiments of Claim 14 as amended.

Claim 16 has been amended to more particularly point out one of the embodiments of Claim 14 as amended. Support for this amendment is further found in Claim 11 of the instant application.

Claim 17 has been amended to more particularly point out and define one of the embodiment of the present invention. Support for this amendment is found in the co-pending U.S. Pat. App. No. 10/780,901, page 16, line 27 through page 17, line 1 and in the original Claim 24; and in the instant application, in the original Claim 7 and on page 12, line 15.

Claim 20 has been amended to incorporate subject matter of Claims 21 - 26, now cancelled.

New Claim 31 is directed to one of the embodiments claimed in the original Claim 1.

This amendment introduced no new matter.

### **Response to Claim Rejections**

#### Claim Rejections Under Judicially Created Doctrine of Obviousness-Type Double Patenting

The Examiner rejected Claims 1-8, 15 and 21 - 35 of the instant application as obvious under judicially created doctrine of obviousness-type double patenting over Claims 1-7, 10, 13-25, 27, 29 and 30 of the co-pending U.S. Pat. App. No. 10/780,901. The Examiner stated that the conflicting claims are substantially identical, but distinguishable by referring in the preamble to either electromagnetic radiation or ultraviolet radiation. The Examiner stated that particles capable of absorbing electromagnetic radiation are inherently capable of absorbing ultraviolet radiation.

Applicants believe that the present amendment and the amendment submitted concurrently in the co-pending U.S. Pat. App. No. 10/780,901 obviates the Examiner's rejection since the amended claims are directed to the subject matter distinguishable by the composition of the particles.

Reconsideration and withdrawal of the rejection are respectfully requested.

#### Claim Rejection Under 35 U.S.C. §102(b) over U.S. Pat. No. 6,344,272

Claims 1 - 30 are rejected as being anticipated by the U.S. Pat. No. 6,344,272 to Oldenburg *et al* (hereinafter, "Oldenburg"). The Examiner stated that Oldenburg teaches a

core/shell particle capable of electromagnetic absorbing and that for all conductive materials, for certain spectral bands, the real part of the dielectric constant is negative. The Examiner further stated that while the refractive indices of the core and the shell materials are not explicitly reported, the such material exemplified by Oldenburg possess the refractive index of at least 1.8. The Examiner concluded that the limitations of the claimed invention are inherently met.

Applicants note that *not all* conductive materials possess a negative real part of the dielectric constant in at least some spectral band. Accordingly, this limitation is *not* inherently met by *any* conducting material and not every conducting material can be used in a radiation-absorbing particle of the present invention. In particular, not all materials listed by Oldenburg in column 6, lines 1-9 are suitable to practice the present invention.

Applicants further note that Oldenburg teaches a particle comprising a conducting shell (column 4, line 67 - column 5, line 2; column 5, line 66 - column 6, line 9). The conducting materials of Oldenburg are either metals such as coinage, noble and transition metals (column 6, line 4 and corrected Claim 3), lead (column 6, line 7), alloys of metals (corrected Claim 5) and conducting organic materials (column 6, line 3).

The amended independent Claims 1, 14 and 17, however, are directed to a particle having a shell comprising a conductive material selected from TiN, ZrN or HfN. Nitrides of metals are not disclosed in Oldenburg. It follows, therefore, that the amended Claims 1, 14 and 17 are novel over Oldenburg.

Furthermore, Applicants submit that Ti, Zr and Hf nitrides are non-obvious over Oldenburg because these materials offer unexpected advantages over the metals of Oldenburg. Specifically, TiN, ZrN and HfN have physical properties of ceramics and are not susceptible to oxidation. Additionally, as the data presented in the instant specification indicates, TiN, ZrN or HfN absorb light in the visible range and require only minimal tuning for many applications.

Reconsideration and withdrawal of the rejection are respectfully requested.

#### Claim Rejection Under 35 U.S.C. §103(a) over U.S. Pat. No. 6,344,272

The Examiner rejected Claims 28 - 30 as obvious over U.S. Pat. No. 6,344,272 (Oldenburg). The Examiner stated that although Oldenburg does not teach the specific structure in which the particles are to be embedded, it would have been obvious for one skilled in the art

to do so because the substrate in which the particles are to be embedded is a result-oriented variation.

Applicants submit that Claims 28 - 30 as amended are not obvious over Oldenburg. Indeed, for the reasons presented above, Oldenburg does not teach the invention of Claim 17 as amended, on which Claims 28 - 30 depend. Therefore, the modification of the teaching of Oldenburg suggested by the Examiner does not result in the invention Claimed in Claims 28 - 30. Therefore, the rejection of Claims 28 - 30 as amended as obvious over Oldenburg is improper.

Reconsideration and withdrawal of the rejection are respectfully requested.


**CONCLUSION**

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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